

### ABSTRACT

#### MANAGEMENT AND CONTROL OF MULTI-LAYER NETWORKS

A communications network has multiple resource-allocation layers and incorporates a management structure for allocating resources to allocate resources requested by a first layer of said layers from a second of said layers. At a first layer, the management structure provides an indication to a second layer of the required resources that are to be allocated from the second layer. The second layer automatically offers the required resource together with a condition for use of those resources. This condition includes a notional price factor which is dependent on current demand. Under the control of the manager, the first layer determines if the condition for use of the offered resources is acceptable and, if so, automatically accepts the offered resources from the second layer. In a preferred embodiment, ingress to an underlying multi-wavelength transport layer of the network is controlled via a virtual port which allocates traffic to real ports one for each wavelength supported by the transport layer.